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as the body: capsules *quadrangular* (inch and a half long, 2 lines thick), incurved and ascending or straightish on very short and stout diverging pedicels: seeds turgid-lenticular, with acute margins and minutely muriculate surface.

The only certain specimens I possess are those of Lindheimer's Texan collection, collected near New Braunfels in 1850 and 1851. Mrs. Bittle once showed me a fine drawing from the living plant, showing the perfectly tetragonal pods. Specimens from W. Texas, without fruit, which may belong here, were collected by Berlandier, Wright, and Girard. It is commended to the attention of Texan botanists.

2. Hood or saccate tip of outer petals (except in cleistogamous flowers) dorsally wing-crested.

* Flowers bright yellow, about two-thirds of an inch long: stem mostly erect.

C. *CRYSTALLINA* Engelm. l. c. Habit of the preceding: flowers spicate, with spur nearly as long as the body; dorsal crest short, very wide and salient, 3 to 4-toothed: capsules linear-oblong, terete, half or three-fourths inch long, erect on very short pedicels, pruinose when fresh with transparent vesicles (such as beset the leaves of *Mesembrianthemum crystallinum*): seeds acute-margined, the coat minutely tubercular-reticulated.

Prairies and fields of Arkansas and S. W. Missouri. Excellent specimens of this, collected by Prof. F. L. Harvey, in Curtiss's distribution.

** Flowers pale yellow, short-spurred, only a quarter or third of an inch in length: stems diffuse and slender: capsules linear and slender, torulose.

C. *FLAVULA* DC. Flowers conspicuously bracted and slender-pedicelled: outer petals surpassing the inner; crest very salient, 3 to 4-toothed: capsules pendulous: seeds acutely margined, rugose-reticulated, at least toward the margins.—*C. flavidula* Chapman, Fl. ed. 2, 604, a slip of the pen.

Lake Erie to Virginia, Tennessee, Missouri and Louisiana.

C. *MICRANTHA*. Flowers short-pedicelled and small-bracted, when full-developed a third of an inch long, narrow, with spur a line or two long, and with rather narrow lunate and entire crests; often with only cleistogamous and much smaller flowers, which are spurless and crestless or only slightly crested: capsules ascending on short or very short pedicels: seeds turgid, obtuse at margin, shining, as in typical *C. aurea*.—*C. aurea*, var. *micrantha* Engelm. in Gray, Man. l. c., only cleistogamous flowers known. *C. aurea*, var. *australis* Chapman, Fl. ed. 2, 604, who had only the normal flowers.

Texas to Missouri and Florida, and at Cape Fear, N. Carolina, *Havard*, whose specimens show earlier normal and later cleistogamous flowers on same individuals. On the Atlantic coast, from N. Carolina to Louisiana (where the normal form was collected by M. Langlois) this appears to be the only species. In Missouri it is said to grow intermixed with *C. aurea*. Confirmation of this is desirable.—ASA GRAY.

Development of Ræstelæ from Gymnosporangia.—The culture of spores of the *Gymnosporangia* of this country upon different *Pomeæ*, which I have undertaken for several years, has been continued this year by Mr. Roland Thaxter in the Cryptogamic laboratory at Harvard. In my own cultures spermatogonia only were produced on the different hosts, but Mr. Thaxter has been more successful, and has been able to produce the æcidia in several cases. His cultures are not yet completed, but I should like to call attention to some

of the results reached, leaving details for Mr. Thaxter's paper on the subject, which will soon appear in print.

The spores of *Gym. clavipes* C. & P. growing on stems of *Juniperus Virginiana* were sown on young plants of *Amelanchier Canadensis* and were followed by a luxuriant growth of *Roestelia aurantiaca* Peck. *Gym. clavipes* was detected for the first time on *Juniperus communis* at Weymouth, Mass., by Mr. J. E. Humphrey, and was afterwards found on the same host in another locality by Mr. Thaxter. Cultures were also made of the foliicolous *Gymnosporangium*, which causes the well known bird-nest distortion of *J. Virginiana*, which is stated in my paper on "Gymnosporangia of the United States" to be a form of *G. clavipes*. The shape of the spores and their pedicels, and the fact that they sometimes germinate at both ends as in *G. clavipes*, lead me to refer the bird-nest form to that species. This view is incorrect, and the bird-nest form is rather to be referred to *G. conicum* DC., and the cultures made by Mr. Thaxter developed the æcidia of *Roestelia cornuta* Fr. on *Amelanchier*, thus agreeing with Oersted's experiments. The spores of *Gym. clavarioforme* DC. on *J. communis* sown on *Crataegus tomentosa* were followed by *Roestelia lacerata* Fr., also agreeing with Oersted's experiments. The cultures of spores of other species of *Gymnosporangium* are still under way and have given some interesting results already, but a full statement will appear later in Mr. Thaxter's paper.—W. G. FARLOW.

The Arillus in Asimina was described by me and figured from Sprague's drawings in the *Genera Illustrata*. Some botanist, I think M. Baillon, has controverted the statement, taking the view that the so-called arillus was only a false membrane, a condensation of the pulp of the pericarp around the seeds. Fresh fruits of *A. grandiflora* and *A. pygmæa*, communicated by Mr. Curtiss from Florida, clearly show the distinct and rather firm membrane, investing the seed and firmly attached at the hilum. I have not been able to study its formation and growth, which is still needful.—A. GRAY.

Gymnosporangium macropus on Pirus coronaria.—The "cedar apples" were gathered from several small trees of *Juniperus Virginiana* on April 12th, and before any of the gelatinous masses or "horns" upon the excrescences had made their appearance. The "apples" were placed in water on a plate in the laboratory until the spores had germinated and produced their sporidia in great abundance. On April 23d, sowings of the sporidia were made upon the young leaves of the wild crab apple (*Pirus coronaria*).

The leaves and tips of branches sown were at once covered with sacs of cloth similar to those used in crossing and hybridizing plants. The same number of sacs were placed upon tips of twigs on which no *Gymnosporangium* spores had been sown.

By the method of forcing the growth of the cedar apples by keeping them moist and in a warm room, the danger of a previous inoculation of the leaves sown was avoided.

On May 12th spermatophytes were found in abundance in process of formation upon the leaves in every instance where sowings had been made. On the other hand, not a sign of a fungus was observed on the unsown leaves under the sacs or on any other parts of the trees. The success of the inoculation was